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STUDIES ON ANDEAN COMPOSITAE V

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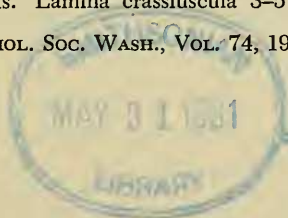
This contribution includes comments and descriptions of species of *Hinterhubera*, *Erigeron*, *Diplostephium*, *Paragnoxys*, *Senecio*, and *Chaptalia*. The materials used for this study are the South American collections of the U. S. National Museum, mainly those from the author's 1959 expedition to the Sierra Nevada de Santa Marta and Sierra de Perijá, Colombia. This trip was sponsored by the National Science Foundation and received substantial help in Colombia from the Instituto de Ciencias Naturales and from the Ministerio de Agricultura of the Colombian Government. A member of the Institute, R. Romero Castañeda, joined the expedition.

Contributions on novelties in other groups will follow this one, and an account of the expedition and its results will be published when the materials are identified. The work upon which this paper is based has been sponsored by the National Science Foundation. The preceding article of this series was published in *Brittonia*, 12: 182-195 (1960).

***Hinterhubera nevadensis* Cuatr., sp. nov.**

Frutex 20-50 cm altus caule basi intricato-ramificato, ramis basi prostratis vel erectis exfoliatis cortice griseo-purpurascenti glabrato squamulis brevibus persistentibus munito; ramuli dense foliosi erecti congestique, copiose glandulosi glandulis minutis pedicellatis foliis subimbricatis plusminusve obtecti.

Folia alterna sessilia ascendentia anguste linearia margine valde revolutoplicata, 5-9 mm longa 0.8-1.2 mm lata, extus utrinque dense pubescenti-villosa glandulosaque pilis sericeis longis (ad 1 mm) patulis plusminusve flexuosis et glandulis globosis minutis stipitatis vestita, intraplicaturam (subtus folii) densissime glandulosa glandulis breviter stipitatis vel subsessilibus. Lamina crassiuscula 3-5 mm longa oblonga basi



paulo angustata et sine sensu in vaginam 2–4 mm longam paulo dilatatam margine longe ciliatam ad caulem adpressam producta.

Capitula discoidea heterogama semiorbiculati-campanulata circa 10 mm alta et diamitentia, explanata 17–19 mm diamitentia, ad terminationem ramulorum breviter pedunculata solitaria (pedunculo ad 10 mm longo). Involucrum 9–10 mm altum bracteis 40 et ultra circa 5-seriatis lineari-lanceolatis acutiusculis nervo medio valde conspicuo intus glabris extus copiose ciliato-villosis et glandulosis glandulis stipitatis et sessilibus praeditis, interioribus fertilibus 7.5–8 mm longis circa 1 mm latis exterioribus gradatim brevioribus ad 5 mm longis 1 mm latis. Flores exteriores feminei tubulosi pluriseriati 90–170 in capitulo involucrum non excedentes, corolla albido-flavescenti 4.5–5 mm longa glabra tubulo capillari 3–3.5 mm longo limbo 5-partito vel 4-partito lobis paulo inaequalibus elliptico-lanceolatis circa 1.2 mm longis; rami styli 0.6–0.7 mm longi lineares supra marginibusque minutissime papilloso; ovarium anguste oblongum basim versus angustatum subcompressum paulo villosum parce glandulosum circa 2.5 mm longum; pappus pilis 2–3-seriatis tenuibus breviter strigulosus inaequilongis 0.2–5.5 mm longis stramineis. Flores centrales hermaphroditi 16–60; corolla regularis tubulosa 4–4.5 mm longa sparsis glandulis capitatis munita, tubulo circa 2 mm longo limbo infra tubuloso sursum gradatim ampliato apice 5 lobis late oblongis subacutis circa 1 mm longis; antherae 1.3 mm longae basi breviter auriculatae; styli rami 0.8 mm longi extus marginibusque dense piloso-papilloso; ovarium anguste lineare paulo compressum basi angustatum 3 mm longum glandulis globosis sessilibus et pilis rigidulis subpatulis dense munitum; pappus stramineus circa 5.5 mm longus pilis inaequilongis (aliquis valde brevis) breviter strigulosus apicem versus paulo dilatatis apice acutis. Receptaculum alveolatum nudum 3.5–4 mm diamitens. (Fig. 1, *a-j*.)

Type locality: Colombia: Magdalena: Sierra Nevada de Santa Marta, southeastern slope: valley descending from the peaks La Reina and Ojeda southwestward; páramos between lakes Naboba and Mamito, 4200–4300 m alt.; shrub 20–50 cm high; involucre brownish, green at base; female corollas pale yellowish white; 3 October 1959, J. Cuatrecasas & R. Romero Castañeda 24585. Holotype, US; isotype, COL.

Remarks: *Hinterhubera nevadensis* is closely related to the Venezuelan species *H. columbica* Schultz Bip. ex Wedd. and *H. ericoides* Wedd. As in *H. columbica*, it has large heads and glandular leaves, but it differs by its more narrowly linear and smaller leaves and its smaller female corollas which do not surpass the involucre, and which have 5–4 shorter lobes. *H. columbica* has subbilabiate female corollas longer than the involucre, 5–7 mm long, with 3 long-linear lobes (2.3–3 mm long) and 2 additional very short lobes which may be reduced to none; the leaves in the Venezuelan species are more broadly sublanceolate-oblong. *H. nevadensis* differs from *H. ericoides* by its larger heads and leaves and by being densely glandular. In *H. columbica* the extended, pressed heads (in herbarium) are 16–20 mm and in *H. ericoides* only 8–12 mm in diameter.

Erigeron peruvianus (Lam.) Cuatr., comb. nov.

- Doronicum peruvianum* Lam., Encyclop. Meth. 2: 316. 1786.
Arnica peruviana (Lam.) Pers., Syn. Plant. 2: 454. 1807.
Aster pellitus HBK, Nov. Gen. Sp. Pl. 2: 91. 1820.
Liabum erigeroides Benth., Pl. Hartw. 206. 1845.
Celmisia pellita (HBK) Sch. Bip., Bonplandia 4: 50. 1856.
Erigeron pellitum (HBK) Wedd., Chl. And. 1: 190, Pl. 34. 1857.
Erigeron lehmannii Hieron., Engl. Bot. Jahrb. 19: 49. 1894.
Erigeron hybridus Hieron., Engl. Bot. Jahrb. 21: 334. 1895.
Erigeron loxensis Hieron., Engl. Bot. Jahrb. 21: 334. 1895.
Erigeron stuebelii Hieron., Engl. Bot. Jahrb. 21: 335. 1895.
Aster peruvianus (Lam.) Cabrera, Bol. Soc. Arg. Bot. 7: 234. 1959.

Remarks: In the shape of the leaves and the density of the hairiness, this is a very polymorphic species. The typical form of the species is found not only in Ecuador but also in Peru and on the Central Andes of Colombia. It has oblong, usually broadly oblong and obtuse or subobtuse leaves of about 1–1.5 cm wide; it has rather thick, woolly scapes and very woolly involucre. A divergent form is common on the Cundinamarca páramos, eastern Andes of Colombia, with linear, acute or subobtuse leaves, usually 1–2.5 mm wide, slender peduncles and glabrescent involucre with usually smaller heads. This is the variety *lineata*. At first this appears to be a distinct species, having been described as such by Hieronymus (*E. stuebelii*), but examination of abundant collections shows the existence of intermediate forms between this form and the typical *peruvianus* in Colombia and Ecuador, making impossible a sharp separation. These intermediate forms are those which have been considered in the past as different species by a few botanists following Hieronymus (*Erigeron lehmannii*, *E. hybridus*, *E. loxensis*), but the features given as differential are actually variable and of minor importance, such as the density or scarcity of the indument on scapes and phyllaries, small variation in the size of the heads, and the width of leaves, which vary from obtuse and broadly oblong to acute and lanceolate, and to narrowly linear. Another feature is the length of the tube of the ligulate corollas, which is long (2.8–3.5 mm) in the typical form and short (2–2.5 mm) in the form *lineata*. The intermediate forms have the corolla-tube variable in length and rather of the short type. In fact, all these forms are part of a large specific complex.

The collections of *E. peruvianus* are usually distributed and labeled in the herbaria as *Erigeron pellitus* (HBK) Wedd. For the first time last year, Cabrera pointed out that *Doronicum peruvianum* Lamarck, whose type specimen is preserved at the Jussieu Herbarium in Paris, is conspecific with it. Cabrera is of the opinion that this species has to be considered as *Aster*, as it was originally described by Kunth. This species certainly has a somewhat critical generic standing, but its 3–4-seriate involucre of linear and almost equal phyllaries and the narrow multi-seriate rays define it as an *Erigeron*. Hieronymus distinguished his *E. stuebelii* from other related species by a silky layer that covers its leaves;

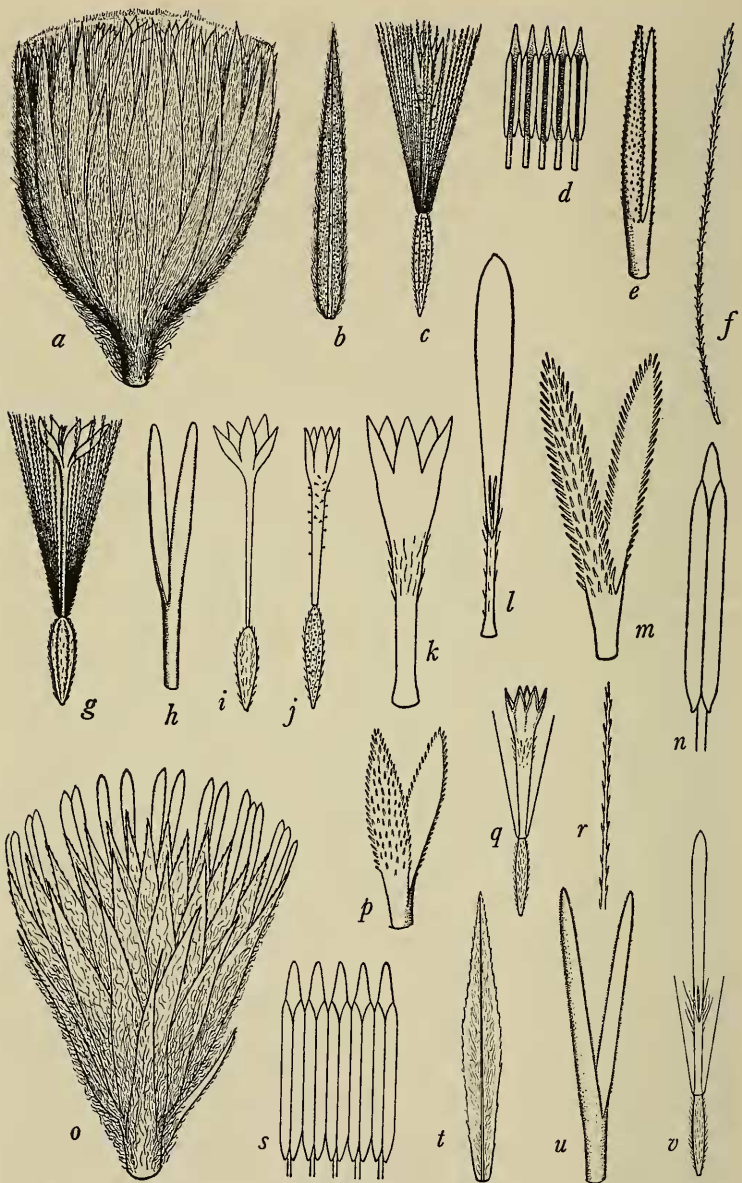


Fig. 1.—*a-j*: *Hinterhubera nevadensis* (Cuatrecasas and Romero 24585). *a*, head, $\times 5$; *b*, inner involucre bract, $\times 5$; *c*, disc flower, $\times 5$; *d*, stamens, $\times 15$; *e*, style end of disc flower, $\times 25$; *f*, pappus hair, $\times 10$;

but this feature actually exists in all varieties of *E. peruvianus*. There is always a silky veil covering the very young leaves which usually separates very soon but sometimes stays on longer until complete maturity; this may happen in forms with narrow leaves but no rules can be established about the longevity of the leaf veil.

***Erigeron peruvianus* var. *lineatus* Cuatr., var. nov.**

Folia radicalia rosulata anguste linearia basim parum angustata apice acuta mucronulata vel mutica margine valde revoluta 3–10 cm longa 1–2.5 cm lata supra velo fibroso-sericeo argentato deciduo tecta subtina crasse crispo-lanata sed costa eminentissima fibroso-sericeo tecta vagina longa dense longeque lanato-villosa. Capitulum hemisphaericum 2 cm latum. Involucrum 0.9 cm altum circa 4-seriatum, bracteis interioribus lineari-lanceolatis 8 mm longis 1 mm latis dorso hirsutulis sursum violaceis. Flores radii feminei 3-seriati circa 65; corolla 7 mm longa tubulo 2 mm longo sursum pilosulo pilis longis tenuibus, lamina oblonga subacuta 0.5 mm lata integra vel obsolete 3–2-dentata; ovarium hirsutulo-villosum; pappus stramineus uniseriatis 3.5 mm longus. Flores disci circa 46; corolla 4 mm longa tubulo 2 mm longo; antherae 1.5 mm basi breviter angustato-auriculatae; rami styli lanceolati crassiusculi longe papilloosi, 1 mm longi; ovarium villosum; pappus 3.5–4 mm longus stramineus uniseriatus. (Fig. 1, *o-v.*)

Type locality: Colombia: Cundinamarca, Cordillera Oriental, Páramo de Zipaquirá, between Zipaquirá and Pacho, 3100–3200 m altitude, "ligules white or lilaceous," 16 June 1940, J. Cuatrecasas 9556. Holotype, US; Isotype, COL.

***Erigeron tergoalbus* Cuatr., sp. nov.**

Herba humilis rosulata scapifera rhizomate verticale crassiusculo ad apicem cum vaginis foliorum crassissime tecto radicibus crassiusculis numerosis oriente.

Folia omnia basilaria rosulato-fasciculata crasse subcoriacea oblongo-linearia apice subite angustata subacuta vel subobtusata basim versus sine sensu in petiolum alatum attenuata margine integra revolutaque basi in vaginam membranaceam longam amplectentem dense longeque fulvo-villosam producta, 20–30 cm longa; limbo 14–22 cm longo 1–1.5 cm lato, petiolo 2–6 cm longo, vagina 2–3 cm longa. Lamina in valde juvenile

g, outer female flower, $\times 5$; *h*, style end of female flower, $\times 25$; *i*, corolla and ovary of female flower, $\times 5$; *j*, corolla and ovary of disc flower, $\times 5$. *k-n*: *Erigeron tergoalbus* (Prieto, Camp P-275). *k*, disc-flower corolla, $\times 7.5$; *l*, ray-flower corolla, $\times 5$; *m*, style end of disc flower, $\times 20$; *n*, anther, $\times 20$. *o-v*: *Erigeron peruvianus* var. *lineatus* (Cuatrecasas 9556). *o*, head, $\times 5$; *p*, style end of female flower, $\times 40$; *q*, disc flower, $\times 5$; *r*, fragment of pappus bristle of outer flower, magnified; *s*, stamens, $\times 15$; *t*, inner involucreal bract, $\times 5$; *u*, style end of female flower, $\times 40$; *v*, ray flower, $\times 5$.

plus minusve velo fibrososericeo argenteo tecta demum supra viridis nervo medio sericeo excepto glabra sublaevisque; subtus minute indumento albo crispo-lanato densissimo compressissimo subfarinaceo oblecta sed costa bene elevata velo sericeo-argentato adpresso induta, 4–5 nervis secundariis ascendentibus prominulis utroque latere saepe conspicuis.

Scapi monocephali axillares pauci erecti folia attingentes vel paulo superantes (25–40 cm longi) striolati leviter lanuginosi vel subglabrati foliolis bracteiformibus numerosis lanceolatis basi late amplexantibus paulo lanuginosis vel glabratibus 2.5–1 cm longis basi 3–2 mm latis praediti. Capitulum 2.5 cm diamitens erectum radiatum. Involucrum circa 5-seriatum bracteae subaequilongis subulatis acutis interioribus circa 11 mm longis 0.8–1 mm latis subglabris margine sursum eroso-ciliatis purpurascens. Flores radii feminei 3-seriati circa 120. Corolla alba 9–10 mm longa tubulo 2 mm longo leviter pilosulo lamina lineari-oblonga subacuta integra vel minutissime tridenticulata 1–3-nervia 0.5–0.7 mm lata. Rami styli lineari subulati subacuti 1.6 mm longi minute papillosuli. Ovarium oblongum compressum densiuscule villosum 3.2 mm longum. Pappus stramineus 4 mm longus pilis uniseriatis inaequilongis. Flores disci hermaphroditi circa 130. Corolla sulphurea 5 mm longa tubulo 2.5 mm longo sursum paulo pilosulo dentibus triangulari-oblongis subacutis margine incrassatis apice minute papillosis 1 mm longis. Antherae 1.8 mm longae basi breviter auriculatae. Rami styli circa 1.5 mm longi lanceolati crassiusculi usque ad basim piloso-papilloso. Ovarium oblongum 3.5 mm longum 5-costatum villosum; pappus pariter floribus femineis. Receptaculum 6 mm diamitente profunde alveolatum marginibus alveolorum undulatis. (Fig. 1, *k-n*.)

Type locality: Ecuador: "Oriente" border, prov. Azuay, crest of the Eastern Cordillera, between Oña and the Río Yacuambí, altitude 10,000–11,200 feet; "plants with pseudobulbs; leaves deep green above, white pubescent below; bracts green tipped with nigrescent-purple; ray flowers white; disc flowers pale sulfur-yellow" collected by F. Prieto in September 1945 under the direction of W. H. Camp, No. P-275. Holotype, NY.

Remarks: *Erigeron tergoalbus* is distinct from the closely related, polymorphic *E. peruvianus*, although it has the same habit. *E. tergoalbus* differs basically in the nature of the white indument on the underside of the leaves. This consists of a thin, compact, almost smooth layer of densely and minutely crisp hairs with a very smooth and farinose appearance. In *E. peruvianus* on the other hand, this indument is thicker and consists of long, crisp, entangled hairs. In *E. tergoalbus* the leaves are also longer, the tube of the ligulate corollas is shorter and the involucre is less hairy (almost glabrous) than in the typical form of *E. peruvianus*.

***Diplostephium antioquense* Cuatr., sp. nov.**

Arbor 4–5 m alta ramis ultimis exfoliatis tortuosis cortice griseo ruguloso cicatricoso glabrato, ramusculis terminalibus foliosis subretibus cinereis vel ochro-cinereis crasse dense adpressequae lanulato-tomentosis.

Folia alterna crasse subcoriacea petiolo 8–12 mm longo striolato dense lanuginoso-tomentoso supra sulcato. Lamina subelliptica utrinque attenuata basi breviter cuneata apice angustata obtusiuscula sed callosomucronulata, margine subplana leviter revoluta subintegra parte inferiore excepta dentibus callosis minutis mucroniformibus remotis praedita, 3.5–9 cm longa 1.5–4 cm lata, supra in vivo atro-luteolo-viridis siccitate griseo-viridis costa stricte impressa tomentulosa reliqua glabra vel parcissimis pilis, nervis secundariis laxo reticuloque impressis conspicisque, subtus albida siccitate ochroleuca dense crasseque lanato-tecta, costa eminenti nervis secundariis circa 10 utroque latere patulis plus minusve conspicuis vel cum tomento velatis reticulo venorum laxo conspicuo vel infra tomentum occulto.

Inflorescentiae corymboso-paniculatae folia vix attingentes ramusculos valde foliosos terminantes, e basi foliosa ramosae, 3–7 cm longae et latae, axi robusto rigido etiam ramis mediocribus ascendentibus dense crasseque lanato-tomentosis in vivo canis in sicco ochroleucis, ramulis ultimis seu pedunculis monocephalis 10–2 mm longis vel capitulos 2–3 sessiles ferentibus; bracteis ovato-oblongis vel ovatis acutis amplectentibus extus lanatis 5–2 mm longis pedunculis subtendentibus, 1–3 circa capitulum instructis. Capitula campanulata 8–9 mm longa circa 6 mm diamitentia, radiata. Involucrum 7–7.5 mm altum tomentosum bracteis 4–5 seriatis interioribus oblongis subacutis margine scariosis eroso-subciliatis 6–6.2 mm longis circa 1.5 mm latis dorso sursum tomentellis brunneo-marginatis, ceteris gradatim brevioribus dorso albido-lanatis, exterioribus ovatis acutis 2 mm longis 1.5 mm altis. Flores radii feminei 13–21, corolla alba 5.5–6 mm longa tubulo angusto recto 3.5–4 mm longo puberulo pilis crassiusculis sparsis praedito, lamina obovato-oblonga 0.8 mm lata apice 2–3-denticulata supra papillosa; stylus corolla aequilongus ramis 0.8 mm longis complanatis dilatato-sublanceolatis intus minutissime papillosis extus grosse papillosis; ovarium oblongum 2 mm longum sparse glandulosum; pappus stramineus circa 5 mm longus pilis acutis minute strigosis sursum leviter subplumoso-dilatatis aliquis exterioribus brevioribus inaequalibus. Flores disci hermaphroditi 10–20, corolla 5 mm longa tubulo crasso 2.6 mm longo pilis crassiusculis brevibus sparsis lobis triangulari-oblongis acutiusculis margine incrassatis 1 mm longis; antherae 2 mm longae basi breviter acutiusculeque auriculatae; extremitas styli 1.5 mm longa incrassato-lanceolata papilloso-pilosa in 2 ramas stigmaticas lanceolatas crassiusculas conniventes 1–1.2 mm longas fissa; ovarium oblongum 2 mm longum sparse glandulosum; pappus stramineus 5 mm longus pilis acutis quam in floribus femineis paulo crassioribus sursum magis dilatatis, exterioribus minoribus strictioribus. (Fig. 2, *a-i*.)

Type locality: Colombia: Antioquia: Medellín, Mount El Boquerón, Alto de Los Baldíos, páramo 3150 m alt.; tree 4–5 m; leaves rather thick, yellowish green, dark above, whitish beneath; branchlets of the inflorescence whitish, edge of the phyllaris brownish, ligules white; 9 April 1958 José Cuatrecasas, Manuel Llano and Gabriel Gutiérrez 24226. Holotype, US; isotype, MEDEL.

Remarks: *Diplostephium antioquense* is closely related to *D. denticulatum* Blake, but differs in having more flexible leaves which are shorter, attenuate towards the base, cuneate, entire or almost entire and with nervation more completely concealed by the tomentum; the heads are larger, with broader and more woolly phyllaries; the ligulate corollas have a widely obovate-oblong limb and a long tube. In *D. denticulatum* the tube of the ray-corollas is shorter (2.5–3 mm) and the limb is linear and acutely 2–3-toothed. The ovaries are more scarcely glandular in *D. denticulatum* than in *D. antioquense*. A related species from Nariño, *D. tabanense* Cuatr., differs from it by its more lanceolate, acute or sub-acute leaves, these usually serrate, having more crowded secondary nerves, by its larger heads, with longer and more lanceolate phyllaries, by larger, linear ray-corollas, and by longer and more slender pedicels.

***Diplostephium saxatile* Cuatr., sp. nov.**

Arbuscula 2–6 m alta ramulis crassis dense cinereo-tomensis cicatricosis ramificatione pseudodichotoma (dichasiali), extremis dense rosulato- seu fasciculato-foliosis.

Folia alterna sessilia, lamina crassa subcoriacea sed mollia lanceolato-oblonga basi paulo attenuata subtrotundata amplectentiaque apice acuta margine dimidio superiore parte serrata dentibus callosis acutis patulis brevibus 2–6 mm inter se remotis, 5–11 cm longa 1.2–2.5 cm lata, supra pallide viridis adpresse villosa, costa lata nervis secundariis visibilibus nervulis minus conspicuis, subtus spise cinereo-tomentosa pilis densis flexuosis intricatis vestita, costa crassa elevata 8–9 nervis secundariis utroque latere prominentibus valde ascendentibus marginem versus arcuato-anastomosantibus nervulis venisque reticulum minutum prominentem formantibus.

Inflorescentiae terminales confertae thyrsoido-paniculatae basi foliosae folia vix attingentes vel paulo excedentes 5–10 cm longae e basi ramosae axi ramisque dense adpresseque cinereo-villosis, pedicellis 0.1–5 mm longis ebracteolatis, bracteis subtendentibus lineari-oblongis 1.5–0.5 cm longis 0.6–1.5 mm latis. Capitula campanulata 10–12 mm alta 8–10 mm lata heterogama sed discoidea. Involucrum campanulatum 9–11 mm altum bracteis herbaceis rigidulis violascentibus 5–6 seriatis interioribus oblongo-lanceolatis acuminatisque 8–10 mm longis 1.5–2 mm latis exterioribus ovato-oblongis et ovatis gradatim brevioribus ovatoribusque infimis 4–5 mm longis 2–3 mm latis subite acutis omnibus nervio medio notato et marginibus subtiliter lacerato-ciliatis dorso praecipue in exterioribus pilosulis vel subglabris. Flores radii feminei ligulati 21–43 bi-triseriati, corolla 5.5–6.5 mm longa tubulo 3–3.5 mm longo superne piloso-pilosulo, lamina obovato-oblonga 0.5–0.6 mm lata apice profunde tridentata dentibus linearibus 0.4–0.5 mm longis, dorso sparse papilloso-pilosula; stylus corollam satis excedens circa 7 mm longus crassiusculus ramis circa 0.8 mm longis lingulatis marginibus incrassatis minutissime papillosulis; ovarium obovato-oblongum compressum tricostatum (una costa tenerior) copiose glandulosum sparse pilosum; pappus 7 mm longus

in sicco luteus pilis inaequilongis biseriatis basi coalitis, compressis strigulis sursum paulo dilatatis versus apicem angustatis acutis, brevioribus 4–5 mm longis strictis. Flores disci hermaphroditis 23–48, corolla lutea circa 6–7.5 mm longa parte media pilosula, tubo 3–4.5 mm longo limbo tubuloso-infundibuliformi dentibus 1 mm longis triangulari-oblongis subacutis apice papillosulis; antherae 2 mm longae saccis basi obtusis vel brevissime auriculatis; rami styli 0.8 mm longi lingulato-oblongi (sublanceolati) acutiusculi extus marginibusque longe denseque papilloso-pilosi; pappus 8 mm longus corollam valde excedens in sicco luteolus pilis inaequi-longis pariter floribus femineis; ovarium 2.5–4 mm longum lineare compressum bicostato-marginatum copiose glandulosum sterile. Receptaculum circa 2 mm diamitente alveolatum marginibus crasse membranaceis obtuse dentatis. (Fig. 2, *j–z*.)

Type locality: Colombia: Magdalena: Sierra Nevada de Santa Marta; southeastern slopes: Hoya del Río Donachuí, between Laguna Esacuriba and the big rocks about 3870 m altitude; rocky páramo 4043–3870 m alt.; “tree 2–6 m; leaves soft, light green above, cinereous beneath; involucre violaceous; corollas yellow,” 6 October 1959, José Cuatrecasas and Rafael Romero Castañeda 24620. Holotype, US; isotype, COL.

Remarks: *Diplostephium saxatile*, strikingly different from the other species of the genus, is a small páramo or subpáramo tree with typical firm, medium-sized, lanceolate, sessile leaves clustered at the end of dichotomic branches. It is also strongly characterized by the small ray-corollas which are much shorter than the styles and the pappus. The short ray-corollas are found only in one other species of *Diplostephium*, namely, *D. anactinotum* Blake. This is also a remarkable endemic of the Sierra Nevada de Santa Marta and is represented by small, dwarf shrubs with small, thick, coriaceous leaves. *D. saxatile* has campanulate, rather large heads with usually a few more female than hermaphroditic flowers; its common proportion is 22 to 25 but some heads can bear twice as many as the regular ones.

Paragynoxys undatifolia Cuatr., sp. nov.

Arbor 6 m alta trunco meduloso recto basi 12 cm diamitente cortice resinoso superne tomentoso, simplex vel candelabriformis 3–5 ramis dense crasseque ochraceo-lanato-tomentosis extremo conferte subrusulato-foliosis deorsum cicatricibus foliorum semi-amplectentibus glabris signatis.

Folia magna alterna crasse coriacea valde convexo-undata. Petiolus validus circa 20 cm longus 12–16 cm crassus striatus leviter verruculosus basi vaginato-dilatatus amplectens dense crasseque ochraceo-lanato-tomentosus. Lamina subovato-elliptica apice attenuata obtusaque basi profunde cordata margine integra sed leviter irregulariterque undulata 50–70 cm longa 28–40 cm lata sinu basali asymmetrico 3–9 cm profundo, supra costa dense lanato-tomentosa cetera juvenili lanato-floccosa mox glabrata, luteolo-viridis nitens sublaevis sed bullato-undata, nervis secundariis conspicuis reliquis obsolete, subtus dense crasseque ochraceo-tomentoso-lanata, costa crassa valde eminenti nervis secundariis 14 vel

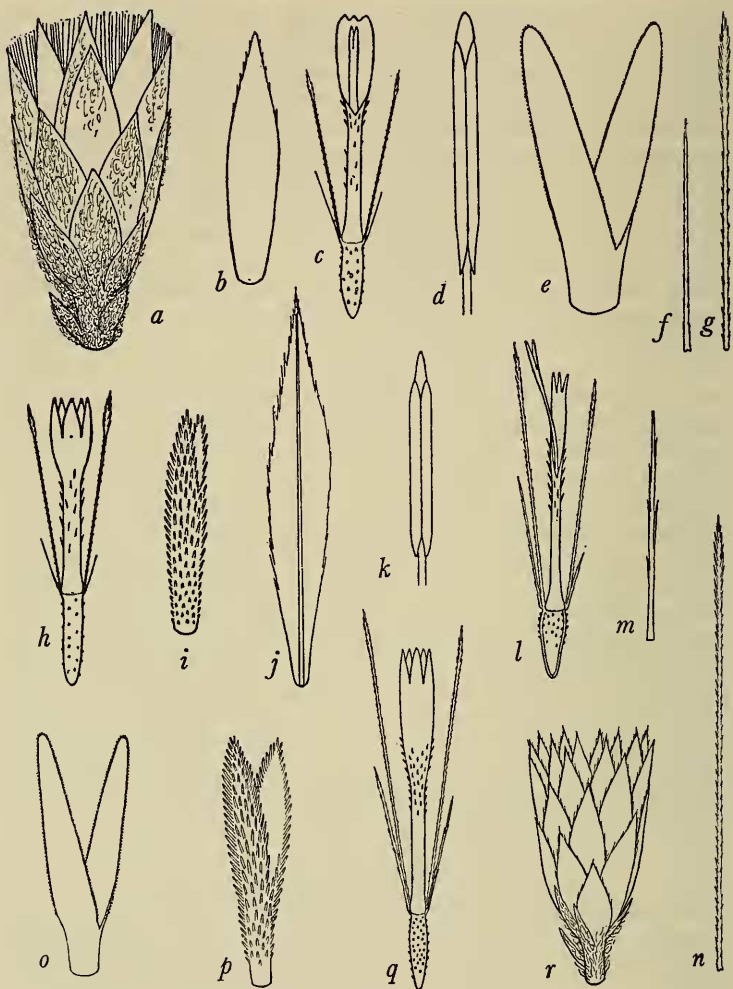


Fig. 2.—*a-i*: *Diplostephium antioquense* (Cuatrecasas et al. 24226). *a*, head, $\times 5$; *b*, inner involucre bract, $\times 5$; *c*, ray flower, $\times 5$; *d*, anther, $\times 15$; *e*, style end of female flower, $\times 40$; *f*, outer pappus bristle of disc flower, $\times 15$; *g*, fragment of inner pappus bristle of disc flower, $\times 10$; *h*, disc flower, $\times 5$; *i*, style end of disc flower, $\times 20$. *j-r*: *Diplostephium saxatile* (Cuatrecasas and Romero 24620). *j*, inner involucre bract, $\times 5$; *k*, anther, $\times 15$; *l*, ray flower, $\times 5$; *m*, outer pappus bristle of disc flower, $\times 10$; *n*, inner pappus bristle of disc flower, $\times 7.5$; *o*, style end of ray flower, $\times 30$; *p*, style end of disc flower, $\times 30$; *q*, disc flower, $\times 5$; *r*, involucre, $\times 5$.

15 utroque latere prominentibus patulis marginem versus ramoso-furcatis anastomosantibus, nervis tertiis reticulo laxo prominenti instructis venulis reticulatis prominulis sed cum indumento cancellatis. Folia valde juvenilia breviter utrinque crasse denseque crispo-lanata.

Inflorescentiae magnae thyrsoideo-paniculatae axillares 50–60 cm longae 30–60 cm latae pedunculo robusto striato dense ochraceo lanato sparse leviterque verruculoso circa 25 cm longo, ramis numerosis crassis paulo flexuosis striolatis ochraceo-lanatis bracteis subtendentibus linearibus 3–7 cm longis crasse villosulo-lanatis; bracteis inferioribus foliaceis 10–20 cm longis 5–7 cm latis. Pedicelli teneri 4–15 mm longi 5–6-bracteolati bracteolis anguste subulatis teneris flexuosis 5–8 mm longis circa 0.5 mm latis. Ramusculi pedicelli bracteolaeque lanuginosi-villosi pilis longis capillaribus intricatis flexuosis. Capitula homogama discoidea 5-flora. Involucrum cylindraceum 8–8.5 mm altum circa 4 mm diamitens 5 bracteis chartaceis plus minusve violascentibus oblongis 8–8.5 mm longis apice subacutis ciliatisque, externis circa 2 mm latis intus 6–7-nervatis internis margine scariosis 3–3.5 mm latis intus 3–4-nervatis, margine eroso-ciliatis dorso sparse villosis vel glabris. Flores omnes hermaphroditi, corolla alba glabra 11 mm longa tubulo crassiusculo 5.5–6 mm longo laciniis linearibus 5 mm longis 0.6 mm latis marginatis 1-nervatis apice acuto minute papilloso. Antherae maturitate exsertae 3 mm longae basi breviter sagittatae acute auriculatae fertiles. Stylus exsertus ramis 3 mm longis contortis crassiusculis subacutis subcomplanatis supra canaliculatis papillosulis sursum extus papilloso-pilosis apice acute panicillatis. Ovarium glabrum 3 mm longum subtriangulare compressum 10-striatum. Pappus stramineus 8 mm longus setis crassiusculis rigidis minute strigulosis numerosis 2–3-seriatis persistentibus basi in brevem anulum achaenium coronantem coalitis. Receptaculum planum leviter 5-foveolatum 1 mm diamitente.

Type locality: Colombia: Magdalena: Sierra Nevada de Santa Marta, southeastern slope: Hoya del Río Donachuí, below Sabanita Diricune, near Col., 3200 m altitude, “tree 6 m high, leaves rigid, coriaceous, bullate, yellowish green above, ochraceous green beneath, corolla white, styles light yellow,” 29 September 1959, J. Cuatrecasas and R. Romero-Castañeda 24485. Holotype, US; isotype, COL.

Remarks: *Paragynoxys undatifolia* is closely related to *P. meridana* Cuatr., but it can be distinguished by its thicker coriaceous leaves, which are more elliptical or oblong, convex and strongly waved, smooth without prominent reticulum on the upper side, and covered beneath with thicker woolly indument of very long, intricate hairs. The petiole, midribs and inflorescence-branches are sparsely and obsoletely verrucose. The flowers are always hermaphrodite, and the corolla tube is equal to or longer than the limb. *P. meridana*, on the other hand, has ovate, flat and less thick leaves with prominent reticulum above, and dense but shorter lanate tomentum beneath and on the petioles. In addition, *P. meridana* has very conspicuously verrucose petioles, midribs and inflorescences. Female flowers often develop through abortion of the anthers. The corolla tube

(4–5 mm) is shorter than the lobes (6 mm). The flowers also have a longer pappus than those of the new species.

Of this striking genus eight species were known (see Cuatrecasas in *Brittonia* 8: 151–160, 1955), each endemic to a restricted area in the Sierra Nevada de Merida, Venezuela, and eastern Andes and Antioquia in Colombia. *P. undatifolia* is an uncommon small tree found in bushy or rocky protected places in the subpáramos or inside the Andean forest on the southern slopes of the Sierra Nevada de Santa Marta. I have seen it between 2500 and 3200 m altitude; inside the forest it may reach a height of 12 m. The pith of the stem is rather soft and I found it to be edible and palatable.

***Senecio doryphyllus* Cuatr., sp. nov.**

Suffrutex 0.2–1 m alta ramis flexuosis striatis inferne cicatricosis, juvenilibus valde foliosis arachnoideis demum glabris plus minusve violaceis.

Folia alterna saepe patentia crassiuscula, lamina oblongo-lanceolata acuta vel acuminata margine leviter revoluta calloso-dentata basi in petiolum valde brevem vel in ramis adultis elongatisque ad 2 cm longum petiolum angustata, in supremis sessilia 3–15 cm longa 0.3–2 cm lata, basi late amplexente vaginata seu brevissime auriculata, utrinque juvenilis arachnoidea denique glabrata, supra atroviridis costa angusta notata reliqua sublaevis sed nervulis reticulatis impressis plus minusve visibilibus, subtus costa prominenti nervis secundariis circa 20 utroque latere conspicuis tenuibus patulis et cum venulis in reticulum laxum anastomosatis, superficie viridis nervis violaceis.

Inflorescentiae terminales paniculatae ad 20 capitulos ferentes (vulgo 8–10), ramis ramulisque tenuibus patulis violascentibus primum arachnoideis deinde glabratibus, basi foliosis, foliis cum caulinis similibus sed sessilibus amplexentibus, sursum gradatim minoribus supremis in bracteis linearibus subulatis 20–5 mm longis 1–0.6 mm latis commutatis. *Pedicelli* 1–3 cm longi teneri bracteolati apice plurimis bracteolis lanceolatis acuminatisque parce arachnoideis vel glabris 3.5–6 mm longis calyculum formantibus. *Capitula* homogama campanulata 1.2–1.5 cm longa et lata saepe cernua vel nutantia. *Involucrum* herbaceum circa 1 cm altum 14–21 bracteis crassiusculis oblongo-lanceolatis apice ciliatis reliquis glabris 7.5–9 mm longis 1.5–2.8 mm latis exterioribus anguste interioribus late membranaceo-marginatis sursum purpurascens. *Flores* omnes hermaphroditi 56–100, corolla lutea 7–9.5 mm longa glabra tubulo angusto 4–5 mm longo limbo tubuloso paulo ampliato, dentibus triangularibus acutis apice leviter incrassato minutissime papilloso 0.8 mm longis. *Antherae* 2.5 mm longae basi brevissime vel obsolete auriculatae. *Rami styli* crassiusculi 1.2 mm longi curvati apice truncati penicillati et saepe piloso-caudati. *Ovarium* glabrum 1.8 mm longum. *Pappus* albus 7–9 mm longus pilis sericeis tenuibus strigulosis 2–3-seriatis.

Type locality: Colombia: Magdalena: Sierra Nevada de Santa Marta, southeastern slopes: Hoya del Río Donachuí; between Laguna Esacuriba and the big rocks about 3870 m altitude; rocky páramo 4043–3870 m

alt., "undershrub 0.3–1 m high, branches flexuose; leaves soft, dark green above, lighter with violaceous veins beneath; branchlets more or less violaceous; involuclral bracts rather dark or purplish at tip; corollas yellow"; 6 October 1959, José Cuatrecasas and Rafael Romero Castañeda 24618. Holotype, US; isotype, COL.

Remarks: *Senecio doryphyllus* belongs to the section *Aetheolena* (Cass.) Hoff., being closely related to *S. patens* (HBK) DC. and *S. cuencanus* Hieron. It can be distinguished by its firm, narrowly lanceolate and dentate leaves, by its broadly oblong-lanceolate phyllaries, and by the deciduous arachnoid (not woolly or tomentose) indument of young leaves and branchlets which, when adult, are glabrous. The Venezuelan *S. longipenicillatus* Sandwith is also related to it, but differs primarily by being densely tomentose. *S. doryphyllus* varies in the size of the leaves, inflorescences and flowers according to environmental conditions. In open places, the plants may develop smaller, densely arachnoideous leaves and more compact inflorescences; under protection and in the shade of large rocks and tall shrubs, the branchlets become elongate, the leaves larger, and the inflorescences larger, spreading and looser. There is also a degree of variation in the size of heads and, accordingly, in the size and number of phyllaries and flowers.

***Senecio harrietae* Cuatr., sp. nov.**

Suffrutex 1–2 m alta caulibus foliosis erectis anguloso-striatis violaceis villosulis pilis brunneis longis subadpressis vel plus minusve flexuosis.

Folia alterna crassiuscula sessilia lanceolata vel lineari-lanceolata apice acuta calloso-mucronulata basim versus angustata basi subite dilatato-auriculata amplexicaulia margine revoluta breviter repandoque denticulata dentibus minutis callosis 3–8 mm distantibus, 2–8 cm longa 4–13 mm lata auriculis semirotundatis 2–10 mm latis, supra pallide viridia juvenilia dense deinde sparse villosa pilis fuscis longis basi incrassatis subadpressis leviterque flexuosis, costa impressa ceteris nervis obsoletis, subtus pallidiora magis villosa costa prominenti nervis secundariis acute ascendentibus 6–8 utroque latere conspicuis reliquis nervis inconspicuis.

Inflorescentia terminalis floribunda corymboso-paniculata folia valde superans, 8–12 cm lata ramis ramulisque violaceis angulato-striatis brunneo-villosis inferne e foliis subtendentibus superne bracteis gradatim brevioribus linearibus et subulatis villosulis 10–4 mm longis. Pedicelli teneri flexuosi vel erecti 3–15 mm longi villosuli plus minusve bracteolati ad apicem 6–8 bracteolis subulatis villosis 3–4 mm longis ad modum calyculi laxi. Capitula heterogama semiglobosa radiata circa 12 mm diametentia. Involucrum campanulatum 5–6 mm altum, 13 bracteis herbaceis viridibus brunnescenti-villosulis sublanceolato-linearibus acutiusculis circa 5 mm longis apice ciliatis margine integris, exterioribus 1.2–1.5 mm latis interioribus late scarioso-marginatis 1.8–2 mm latis. Receptaculum nudum alveolatum. Flores radii feminei ligulati 13, corolla lutea glabra patenti 8 mm longa tubulo 2.3 mm longo lamina elliptico-oblonga 5-nervata 1.5–1.8 mm lata apice minute 3-denticulata; ramuli

styli 1 mm longi tubuli corollae paulo exserti lineari minutissime papilloso apice subtruncati papillosuli; ovarium 1 mm longum ellipsoideo-oblongum 5-costatum glabrum; pappus sericeus albus 2.8–3 mm longus pilis inaequilongis biseriatis minute strigulosis basi coalitis. Flores disci hermaphroditi 32–44, corolla tubulosa glabra lutea 4.6 mm longa tubulo 1.5 mm longo limbo tubuloso-infundibuliformi dentibus triangulari-oblongis 0.6 mm longis subacutis apice papilloso; antherae 1.2 mm longae sagittatae caudis 0.15 mm longis; filamenta extremo in 0.5 mm longitudine incrassata; rami styli 1 mm longi crassiusculi paulo complanati apice subtruncati breviter papilloso-piloso-coronati; ovarium 1.2 mm longum glabrum acute 5-costatum; pappus 3 mm longus albus sericeus pilis biseriatis minute strigulosis.

Type locality: Colombia: Magdalena: Sierra Nevada de Santa Marta, headquarters of Río Sevilla, western slopes of the Sierra, in river canyon below camp at an altitude of 3400 m, January 1959, Harriet Barclay 6690. "Shrub to 2 m tall; stem dark red-purple to green with dark hairs; leaves auricled with branch above each leaf; leaves dark green above, lighter below, revolute, brown hairs on both sides; small heads with yellow rays; involucre bracts margined with brown, tipped with hairs; disc flowers yellow." Holotype, US.

Remarks: *Senecio harrietae* is somewhat similar to *S. subarachnoideus* Sch. Bip., from the northern slopes of the Sierra Nevada, but the latter has almost coriaceous, obtuse leaves dentate only at apex, large heads, and another kind of indument. The natural affinities of *S. harrietae* are toward *S. pectioides* Rusby, from the Bolivian Andes, from which it differs by the villous and loose nature of the indument, its smaller heads and flowers, the shorter and wider involucre bracts, and by other differences in the shape of the leaves.

***Senecio favillosus* Cuatr., sp. nov.**

Suffrutex 1 m alta ramis flexuosis scandentibus argute striatis tomento subadpresso lanato-arachnoideo albo-cinereo tectis.

Folia alterna subcoriacea crassiuscula. Petiolus 5–12 mm longus lanuginoso-arachnoideus cinereus. Lamina ovato-lanceolata basi obtusa apice attenuata obtusiuscula vel subacuta minute callosomucronata margine remote serrulata dentibus callosis 2–5 mm distantibus, 3–8 cm longa 1.3–4 cm lata, supra juvenilis dense lanuginoso-arachnoidea subargentea deinde subglabrata sparse arachnoidea viridis laevis costa nervisque secundariis paulo conspicuis, subtus juvenilis albo-argentata dense induta deinde cinerea indumento lanato-arachnoideo mucido tecta costa eminenti nervis secundariis 5–7 utroque latere ascendentibus marginem versus curvatis evanescentibus vel anastomosatis nervulis inconspicuis vel laxo reticulo leviter notato.

Inflorescentiae paniculatae breves 3–7 cm longae ramulos breves terminantes folia paulo superantes, pedunculo ramulisque cinereo-arachnoideo-lanatis bracteolis subulatis circa 8–5 mm longis 1–0.5 mm latis lanato-cinereis. Pedicelli 2–5 mm longi cinereo-lanati paucis bracteolis

subulatis 3–4 mm longis 0.5 mm latis flexuosis instructi. Capitula subglobosa parva homogama circa 7–8 mm alta lataque. Involucrum cupulatum 5 mm altum 11–13 bracteis herbaceis ovato-lanceolatis acutis vel paulo acuminatis crassiusculis 4.5–5 mm longis, exterioribus haud vel anguste scarioso-marginatis uno latere 1–1.8 mm latis, interioribus marginibus late scariosis 2–2.5 mm latis, dorso apiceque albo-lanatis. Calyculum 5–6 bracteolis subulatis flexuosis 3.5–4 mm longis 0.5 mm latis basi capituli apiceque pedicelli. Flores omnes hermaphroditi 55–58 in capitulo, corolla tubulosa lutea 5 mm longa glabra tubulo 2 mm longo limbo infundibuliformi 5-lobato lobis oblongis subacutis 0.8–0.9 mm longis apice minute papillosulis. Antherae 1 mm. longae basi sagittatae caudatae, caudae 0.2 mm longae. Rami styli curvati 0.8 mm longi crassiusculi subcomplanati minutissime papillosi apice subtruncati papillosi breviter coronato-penicillati. Ovarium 1.5 mm altum 5-costatum glabrum. Pappus albo-sericeus 4 mm longis setis subbiseriatis scabris deciduis.

Type locality: Colombia: Magdalena: Cordillera Oriental: Serranía de Perijá, Corregimiento de Manaure: Sabana Rubia, "bosque dentro del páramo," 2700 m alt., 5 March 1959, R. Romero Castañeda 7449. Holotype, US; isotype, COL.

Remarks: *Senecio favillosus* is a subshrub with spreading or climbing branchlets, which superficially resembles some members of the section *Streptothamnus* Greenm., but actually it has no close relationship to any other species of Andean *Senecio*. It is distinguished by its discoid, rather small heads and by its subappressed, woolly-arachnoid, cinereous tomentum covering branchlets, inflorescences and the ovate-lanceolate, not reticulate, leaves.

***Senecio romeroi* Cuatr., sp. nov.**

Herba 60–90 cm alta radice tenui caule simplici erecto robustiusculo striato indumento albo arachnoideo deciduo tecto.

Folia basilaria rosulato-fasciculata 10–12 crasse herbacea longe petiolata. Petiolus 10–18 cm longus 2–3 mm latus striatus arachnoideolanuginosus sursum anguste marginatus basi breviter amplexente vaginatus vagina submembranacea nervata circa 1 cm longa lataque. Lamina elliptico-oblongissima, 12–20 cm longa 1.8–3.5 cm lata, basi subite cuneato-attenuata plus minusve cum petiolo decurrens apice paulo attenuata obtusa, margine leviter revoluta vel adulta plana dentata dentibus callosis 0.5–1 mm eminentibus 2–4 mm inter se distantibus, supra atro-luteolo-viridis in juvenilibus sparse arachnoidea demum glabra costa conspicua nervis secundariis 12–14 utroque latere curvato-ascendentibus tenuibus cum reticulo impresso leviterque conspicuo anastomosatis, subtus albo-cinerea tomento lanato denso tecta tantum costa plus minusve glabrata prominenti reliquis nervis occultis vel leviter notatis. Folia caulina numerosa alterna, inferiora cum basilaribus similia sed sursum petiolo gradatim breviori latorique et lamina magis decurrenti, media sessilia oblonga cordato-amplexentia 20–14 cm longa, suprema lanceolata acutiuscula basi cordata amplexentia 14–8 cm longa 1.6–1.8 cm lata.

Inflorescentia corymboso-paniculata circa 15 cm longa et lata 25–30 capitulis ramis erectis striatis arachnoideis bracteis lanceolatis subtus albo-cinereo-lanatis inferioribus foliaceis 5–6 × 1 cm sursum gradatim minoribus supremis linearibus acutis 8–5 mm longis 1.5–1 mm latis. Pedicelli 5–2.5 cm longi recti erecti sparsis bracteolis linearibus muniti. Capitula radiata erecta 3–3.5 cm diamitentia. Involucrum campanulatum circa 1 cm altum 1 cm diamitente 32 bracteis subbiseriatis herbaceis viridibus lineari-lanceolatis acutis 8–9 mm longis dorso crassis, externis 1–1.2 mm latis margine anguste scariosis, internis 1.5–2 mm latis margine late scariosis, glabris apice ciliato-penicillato excepto. Calyculum breve 14–16 bracteolis lineari-lanceolatis acutis 4–5 mm longis glabris vel parce arachnoideis ad apicem pedicelli imbricatis dimidium involucri non attingentibus. Flores radii feminei ligulati circa 17, corolla lutea 16–18 mm longa tubulo subcapillari 7–7.5 mm longo sursum parce puberulo, lamina oblongo-elliptica apice minute 3-denticulata circa 8-nervata saepe 4 nervis conspicuioribus 9–10 mm longa 3–5 mm lata; rami styli vix exserti 1 mm longi lineares subobtusissimi minutissime papilloso-pilosi; ovarium glabrum 1.2 mm longum; pappus albus circa 7 mm longus pilis sericeis tenuibus minute scabrosis pluriseriatis. Flores disci hermaphroditi circa 140, corolla tubulosa lutea glabra 8 mm longa tubulo subcapillari 4 mm longo limbo tubuloso 5-nervato 5-dentato dentibus oblongo-triangularibus 0.6 mm longis apice incrassatis minute papilloso-pilosis; anthaerae 1.5 mm longae basi brevissime auriculatae; rami styli 1 mm longi crassiusculi minute papilloso-pilosi supra sulcati apice truncati papilloso-pilosi; ovarium glabrum 1.5 mm longum striolatum; pappus 7 mm longus sericeo-albus pilis tenuibus pluriseriatis.

Type locality: Colombia: Magdalena: Sierra Nevada de Santa Marta, southeastern slopes: Hoya del Río Donachuí, páramos near Meollaca, about 3560–3500 m altitude; “herb 60 cm, leaves rather thick, soft, dark yellowish green above, cinereous beneath; petioles and midribs violaceous; involucre green; ligules and florets yellow,” 6 October 1959, José Cuatrecasas and Rafael Romero Castañeda 24622. Holotype, US; isotype, COL.

Remarks: *Senecio romeroi* is closely allied to *S. folidentatus* Cuatr., from which it differs by its narrower, oblong, almost linear, obtuse basal leaves, with shorter and more obtuse dentation, the whitish, lanate tomentum that covers the leaves beneath, the longer calyculus (attaining half the length of the involucre), and by the higher number of phyllaries (32 in *S. romeroi*, 20 in *S. folidentatus*). The same features may distinguish *S. romeroi* from the Venezuelan *S. funckii* Sch. Bip. This Venezuelan species, furthermore, differs by its shorter ovate-elliptic, cordate basal leaves; the rosette-leaves of *S. funckii* were unknown by Schultz Bipontinus and also by Weddell, who wrote in *Chloris Andina* 1:125, 1855, “inferioribus petiolatis s. valde angustatis.” These words probably refer to the lower leaves of the stem and not to the rosular leaves. Rosette leaves are present in specimens of later collections now preserved

at the U.S.N.M. (Jahn 1130, Aristeguieta 2640, etc.), allowing a more complete concept of *S. funkii*.

***Senecio rugosus* Cuatr., sp. nov.**

Frutex scandens ramis strictis tortuosis striolatis viridibus juvenilibus albo-lanuginosis demum glabratis, ramulis ultimis valde divaricatis seu reflexis.

Folia alterna subcoriacea rugosa petiolo 1–2 cm longo albo-lanato supra sulcato basi biauriculato vaginato amplexicauli auriculis suborbicularibus 3–10 mm latis, lamina oblongo-ovata vel subovato-lanceolata basi obtusa apice attenuata subacuta vel acuta callosomucronulata, margine leviter revoluta subintegra, 3–7 cm longa 1.1–3.6 cm lata, supra rugosonervata saepe bullata dilute lanuginosa vel glabrata luteolo-viridis nitidaque costa angusta impressa reliquis nervis impressis reticulatis, subtus in vivo albido-lanata in sicco viridi-flavescenti vel ochroleuca indumento crispo lanato tecta costa valde eminenti nervis secundariis 6–8 utroque latere curvato ascendentibus prominentibus cum nervulis prominentibus laxe reticulatis anastomosatis.

Inflorescentiae dichotomo-paniculatae ad ramos ultimos breves pseudo-paniculam foliosam compositam formantes; ramuli divaricati albido-lanuginosi 1–3 cm longi basi foliosi sursum bracteis linearibus vel subulatis 5–3 mm longis albatis; pedicelli 0.1–3 mm longi lanati parvis bracteis aliquando 1–3 capitulis sessilibus instructis. Capitula homogama parva campanulata 7–8 mm longa 6 mm lata. Involucrum cupulatum 4–4.5 mm altum, bracteis 8 raro 9–10 crassiusculis ovatis et lance-ovatis acutis extus albo-lanatis 3–3.5 mm longis, exterioribus circa 1 mm latis magis acuminatis, interioribus margine late scariosis 1.7–2 mm latis. Calyculum 3–4 bracteis subulatis flexuosis lanuginosis 3–3.5 mm longis ad basim capituli apicemque pedicelli. Flores omnes hermaphroditi 21–28 in capitulo, corolla tubulosa lutea 5 mm longa glabra tubulo 1.6 mm longo limbo tubuloso-infundibuliformi dentibus linearibus subacutis ad apicem leviter incrassatis, circa 1.3 mm longis. Antherae 1.5 mm longae basi longe caudatae caudiculis subulatis tenuibus 0.3–0.4 mm longis. Rami styli crassiusculi 1.2 mm longi minute papillosuli apice truncati papilloso-penicillati saepe piloso-caudati. Ovarium leviter striatum glabrum 1 mm longum. Pappus albo-sericeus 4.5 mm longus pilis breviter strigulosis 2–3-seriatis. Receptaculum circa 1.5 mm diamitens alveolatum marginibus argute elevato-dentatis.

Type locality: Colombia: Magdalena: Cordillera Oriental, Sierra de Perijá east of Manaure at Quebrada de Floridablanca, in bushes and Andean forests, 2700–2800 m alt.; “climbing undershrub; leaves subcoriaceous, rugose, yellowish green above, whitish beneath; involucre light green; corollas yellow,” 10 November 1959, José Cuatrecasas and Rafael Romero Castañeda 25180. Holotype, US; isotype, COL.

Remarks: *Senecio rugosus*, somewhat resembling *S. bullatus* Benth., is unique among the Andean climbing species of the genus by its strongly rugose, auriculate leaves and small heads.

***Chaptalia incana* Cuatr., sp. nov.**

Herba rosulata scapigera lana alba plus minusve dense obtecta, rhizomate tenui obliquo fibroso-radicefero.

Folia omnia basilaria rosulato-fasciculata lineari-oblonga vel lanceolato-lineariter crasse subcoriacea rigidula subapicem attenuata apice callosomucronulata basim versus sine sensu in brevem petiolum angustata basi subite in longam vaginam scariosam amplectentem araneoso-lanatum ampliata, margine revoluta dentibus callosis mucroniformibus remotis (6–10 mm distantibus) munita, 5–14 cm longa 4–12 mm lata, vagina 3–4 cm longa 0.8–0.9 cm lata, limbo supra albo-arachnoideo-lanato aliquando vetusti glabrato viridique laevi enervato, subtus dense crasseque candido-lanato tantum costa prominenti.

Scapi floriferi axillares solitarii (1–3 in roseta) tenues erecti monocephali dense albo-lanati 7–26 cm longi, juveniles folia attingentia veltustiores valde superantes, bracteis lineari-subulatis flexuosis 10–7 mm longis 1–0.5 mm latis lanuginosis inferne remotissimis sursum numerosis basi capitulum cum involucre subimbricatis muniti. Capitula erecta vel reclinata campanulata radiata 2–2.5 cm alta. Involucrem basi conicum, bracteis 4–5 seriatis imbricatis herbaceis rigidulis plus minusve purpurascenscentibus interioribus fertilibus circa 12 uniseriatis sublanco-linearibus acutis integerrimis, dorso albo-lanuginosis, costa eminenti margine basique scariosis 17–22 mm longis 2–2.5 mm latis, bracteis exterioribus gradatim brevioribus angustioribusque et magis acutis, inferioribus 7–9 mm longis sine sensu et cum bracteolis pedunculi imbricatis descendens. Flores marginales feminei ligulati uniseriati 17–21 involucrem excedentes; corolla glabra 14–16 mm longa lamina supra alba subtus lilacina oblonga 3-dentata nervis 4 paulo visibilibus 1.6–1.8 mm lata tubulo subcapillari 5–6 mm longo basi lamina saepe 2 dentibus brevibus munita; rami styli anguste lineares obtusi glabri supra margineque minutissime papilloso; ovarium lineare sursum subrostrato-angustatum glabrum compressum submarginatum; pappus flavo-stramineus 7 mm longus pilis triseriatis minute strigulosus basi in annulo connatis. Flores feminei interiores biseriati 10–16 tubulosi; corolla glabra 6.5–7 mm longa imperfecte bilabiata, tubulo subcapillari apice limbo 1–1.2 mm longo labio exteriori breviter ligulato tridentatoque interiori 2-dentato vel tubo apice valde oblique 5-dentato; stylus ovarium pappusque cum floribus ligulatis similes. Flores disci hermaphroditi 14–25 bilabiati; corolla 9–10 mm longa basi 4 mm longe tubulosa cetera gradatim ampliata, limbo bilabiato labio exteriori 2.5 mm longi 3-dentato dentibus acutis circa 0.8 mm longis interiori in 2 lacinias lineares revolutas partito; antherae 3.5 mm longae basi longe caudatae (caudae 0.8 mm longae); styli rami crassiusculi subspathulati obtusi 0.8 mm longi sursum apiceque breviter crasseque pilosulo-papilloso; ovaria sublaevia sursum compressa binarginata et 3 costis tenuissimis fere inconspicuis. Achaenia non evoluta. Receptaculum nudum foveolatum. (Fig. 3, *k-w*.)

Type locality: Colombia: Magdalena: Sierra Nevada de Santa Marta, southeastern slopes: Hoya del Río Donachuí: Meollaca (or Meuyaca),

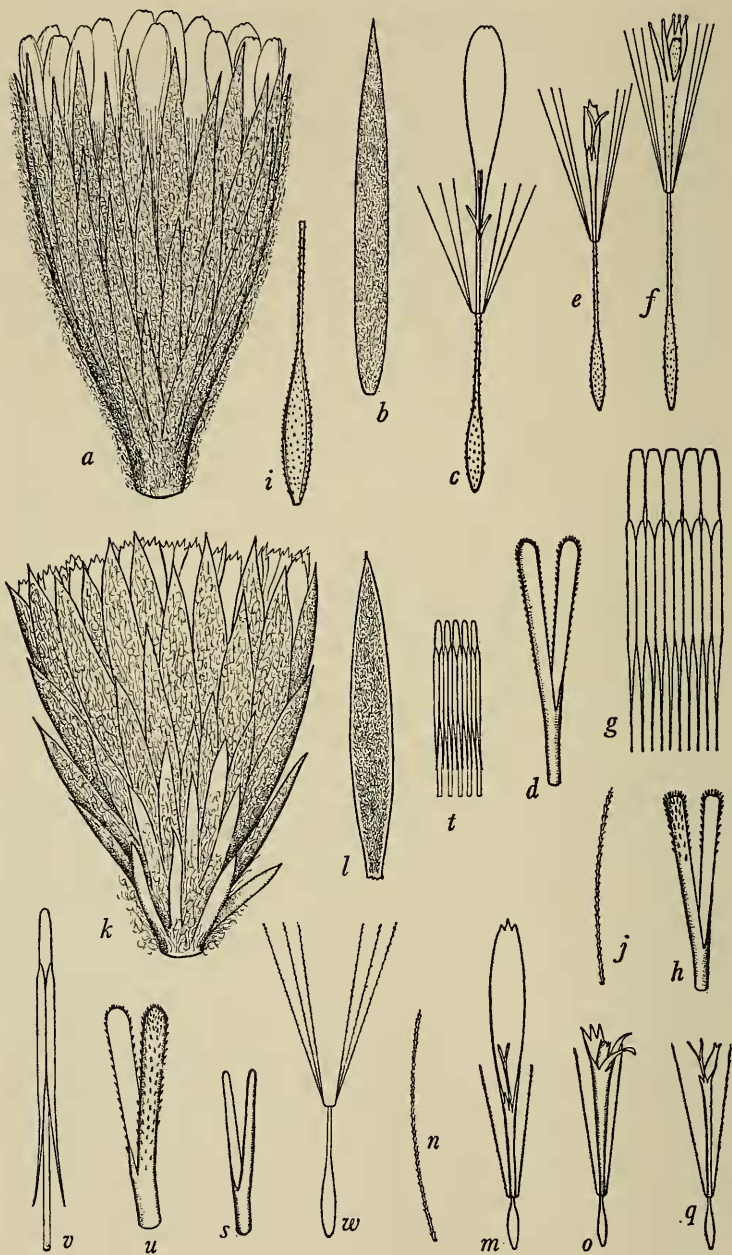
páramo, bushy prairies 3320–3260 m alt.; ligules white above, lilaceous beneath; 28 September 1959, J. Cuatrecasas and R. Romero Castañeda 24438; Holotype, US; isotype, COL. Sierra Nevada de Santa Marta, southeastern slopes: Hoya del Río Donachuí: Laguna de Calocribe, east of Meollaca, páramo 3600–3700 m alt.; leaves greenish above, white beneath; involucre bracts green purplish; ligules white above, ± violaceous beneath 30 September 1959, J. Cuatrecasas and R. Romero Castañeda 24549; paratypes, US, COL.

Remarks: *Chaptalia incana* must be placed in the section *Leria* (DC.) Burkart. It differs from all other species chiefly by its narrow-linear white-woolly leaves and its general white tomentum. The shape of its heads and of its three kinds of corollas distinguishes *Chaptalia incana* from other species which may have somewhat similar leaves (such as *Ch. runcinata* var. *graminifolia* (Dus.) Burkart).

***Chaptalia paramensis* Cuatr., sp. nov.**

Herba rosulata scapigera rhizomate inclinato fibroso-radicifero. Folia omnia basilaria alterna petiolata subcoriaceo-herbacea crassiuscula, petiolo 2–7 cm longo crassiusculo striato ochroleuco vel griseo-lanato basi subite in vaginam scariosam amplectentem circa 1 cm longam et latam dilatato; lamina ovoidea vel oblongo-ovoidea apice obtusa vel paulo attenuata basi plus minusve inaequilatera subcordata vel truncata aliquando leviter subiteque decurrens margine leviter grosse dentata 3–8 cm longa 2.5–5 cm lata, supra juvenilis indumento arachnoideo-lanato ochroleuco deciduo adulta glabrata atroviridis nervis secundariis tenuibus paulo conspicuis, subtus dense crasseque ochroleuco- vel griseo-lanata costa eminenti nervis secundariis circa 5 utroque latere bene ascendentibus plus minusve conspicuis.

Scapi axillares singuli monocephali 15–26 cm longi suberecti crassiusculi ochroleuco-lanati ebracteati ad apicem incrassati saepe deflexi. Capitula radiata campanulato-conica 20–25 mm alta cernua vel nutantia. Involucre turbinatum bracteis imbricatis 6-seriatis subherbaceis linearilanceolatis acutis margine scariosis plus minusve violaceis dorso lanatis, interioribus 20 fertilibus 20–21 mm longis 2–2.5 mm latis reliquis gradatim brevioribus exterioribus 6–4 mm longis 1–0.7 mm latis. Flores radii feminei 22–33 subuniseriati; corolla alba glabra ligulata subbilabiata 15–16 mm longa ligula oblonga 2 mm lata obscure 4-nervata apice attenuata integerrima vel minute 2–3-denticulata basi 2 dentibus linearibus 0.6–0.7 mm longis praedita, tubulo subcapillari 5–5.5 mm longo; rami styli tubulum superantes lineares obtusiusculi supra minute papilloso; ovarium fusiforme subcompressum bimarginatum sparse minuteque pilosulum 3.5 mm longus apice rostrum filiformen 4–4.5 mm longum productum; pappus stramineus 6–7 mm longus pilis breviter strigulosis triseriatis. Flores feminei interiores 35–45, corolla brevi subbilabiata 9–9.5 mm longa tubulo angusto 5–5.5 mm longo labio exteriori ligulato lamina 3.5 mm longa 0.6 mm lata apice tridentata interiori brevi 2 laciniis brevibus saepe inaequalibus 0.5–0.7 mm longis instructo; rami styli 1.5–2 mm



longi lineares obtusi supra minute papilloso; ovarium 4.5–5 mm longum fusiforme subadpressum bimarginatum apice rostratum minutis pilis sparsis praeditum. Flores disci hermaphroditi circa 41 tubuloso-zygomorphi; corolla 9–9.5 mm longa bilabiata, tubulo circa 4 mm longo sursum in limbum tubulosum sine sensu ampliatum producto, labio exteriori oblongo 2-nervato circa 3 mm longo 1.3 mm lato apice profunde tridentato labio interno in 2 laciniis lanceolato-lineares 2.5–3 mm longas partito, apice dentibus laciniisque capitato-incrassatis papilloso-glandulosis; antherae sagittatae 4.5 mm longae appendicibus apicalibus obtusis 1.4 mm longis ad basim caudiculis subulato-filiformibus circa 1.5 mm longis. Rami styli lineares crassi 1 mm longi ad apicem rotundati papilloso-pilosi intus minutissime papillosuli; ovarium tenue cum rostro circa 9 mm longum, sparse minuteque pilosulo; pappus stramineus 8–9 mm longus pilis tenuibus rigidis minute strigulosis 3-seriatis. Achaenia immatura subfusiformia 4.5 mm longa tenuiter 5-costata minute sparseque pilosula apice in rostrum 4–4.5 mm longam producta. Receptaculum nudum foveolatum. (Fig. 3, a–j.)

Type locality: Colombia: Magdalena: Sierra de Perijá, plain between Cerro Venado and Cerro Avión, páramo 3270–3350 m alt.; leaves rather thick, dark green above, white and more or less purplish beneath; involucre more or less purplish, 8 November 1959, J. Cuatrecasas and R. Romero Castañeda 25117. Holotype, US; isotype, COL.

Remarks: *Chaptalia paramensis* has a similar appearance and is closely related to *C. meridensis* Blake, from the Sierra Nevada de Mérida, Venezuela. The Sierra de Perijá species has more markedly herbaceous, although thick, subcarinose leaves which have shorter petioles and ovate blades. The floral scapes are also thicker, especially near the apex, the heads are larger and include a greater number of larger flowers, the involucre is woolly-tomentose, and the ovaries and achenes are minutely pilose and long-rostrate.

Fig. 3.—a–j: *Chaptalia paramensis* (Cuatrecasas and Romero 25117). a, head, $\times 2.5$; b, inner involucral bract, $\times 2.5$; c, outer female flower, $\times 2.5$; d, style end of outer flower, $\times 10$; e, inner female flower, $\times 2.5$; f, disc flower, $\times 2.5$; g, anthers, $\times 10$; h, style end of disc flower, $\times 10$; i, achene, $\times 2.5$ (the rostrum sectioned below the pappus); j, fragment of pappus bristle, $\times 10$. k–w: *Chaptalia incana* (Cuatrecasas and Romero 24438). k, head, $\times 2.5$; l, inner involucral bract, $\times 2.5$; m, outer female flower, $\times 2.5$; n, fragment of pappus bristle, $\times 10$; o, disc flower, $\times 2.5$; q, inner female flower, $\times 2.5$; s, style end of female flower, $\times 12.5$; t, anthers, $\times 5$; u, style end of disc flower, $\times 10$; v, stamen, $\times 10$; w, diagrammatic young achene with its pappus, $\times 2.5$. The pappus in the figured flowers (in m, o and q) is represented by only 2 bristles.